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Description and Use
OF THE
PARALLEL SCALES,
As MADE AND SOLD
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L O N D O N,
OPTICAL and MATHEMATICAL
INSTRUMENT MAKER
TO HIS
ROYAL HIGHNESS
The PRINCE of WALES.



DESCRIPTION, &c.

THESE Parallel Scales consist of a right Angle Triangle, whose Hypotenuse, or longest Side is three Times the Length of the shortest ; also two Rect-Angular Rulers, each twelve Inches.

They answer every Purpose of a Parallel Ruler, including the superior Advantage of erecting Perpendiculars, almost instantaneously to any Part of a given Line.

They preclude in a great Measure the Use of the Compafs, by drawing Lines parallel at any required Distance, with the greatest Accuracy, by Means of the artificial Scales on the Edges of these Rulers ; consequently most Plans may be drawn with uncommon Accuracy in Half the usual Time.

First, as a Parallel Ruler.

Place the longest Side of the right Angle Triangle against the Edge of either of these Rulers, keeping the shortest Side towards

the right Hand. In this Position move them as one Body, until the slope Edge of the Triangle lyes in the Direction intended to draw your Parallels ; draw a line along the slope Edge of the Triangle ; then, in order to draw another Parallel to it underneath this Line, keep the rect-angular Ruler fixed, and slide the Triangle to the Right. —If Parallels are required above the given Line, slide the Triangle to the Left.

If required to draw Lines parallel at a great Distance, take away the Triangle, keep the Ruler fixed ; lay the other Ruler close to the Edge of this Ruler ; keep the last fixed ; remove the First, place them thus alternately against each other, either forward or backward, until you have gained the required Distance. Return the Triangle ; draw a Line along the slope Edge, and it will be parallel to the first given Line.

Secondly.—Their great Use in erecting Perpendiculars to any Part of a given Line. The Hypotenuse, or longest Side of the Triangle being placed against the Edge of either Ruler, move them as one Body until the Triangle lyes in the required Position, keeping the shortest Side to the Right ; draw a Line along the slope Edge,—slide the Triangle

angle to the Left, and you will soon observe the said shortest Side become a Perpendicular to this Line; consequently a Line drawn along this Side, will be required Perpendicular.

If you desire a very long Perpendicular, lay the Triangle on its Back, with the shortest Side against the Ruler, then the Hypotenuse will become a Perpendicular to the above Line.

Thirdly.—Their chief Excellence in drawing Lines parallel to each other at any required Distance, uncommonly accurate, without the Assistance of the Compasses.

On every Edge of the rect-angular Rulers, is an artificial Scale, three Times as big as its corresponding natural Scale underneath. These natural and artificial Scales must exactly bear the same Proportion to each other as the shortest Perpendicular does to the Hypotenuse or longest Sides of the right Angle Triangle.

The Triangle has an Index Point or *flower de luce*, which must first be placed so as to correspond with the Cypher or O in the Middle of these Rulers.—These Numbers reckon both Ways, to the Right or to the Left; by confining the Ruler, and sliding the Triangle either

either Way, Lines may be drawn parallel on either Side of a given Line, at any Distance pointed out by the Index on the Triangle.

By working this Index or Flower de Luce on your chosen artificial Scale, the Sight is greatly assisted, being always three Times as big as the natural Scale of your intended Plan. If Lines are drawn parallel according to any required Number or Distance pointed out by the Index on the Triangle, reckoning from the Cypher or O in the Middle of the Ruler, they will always agree with an equal Number set off perpendicularly with the Compasses from the natural correspondent Scale of your Plan.

As longer parallel Rules may be required, I would recommend Two common rect-angular Rulers of two Feet, or twenty-four Inches, one of them divided into Inches and Tents, reckoning twelve Inches both Ways to the Right and Left, from the Cypher or O in the Middle of the Ruler, together with a large proportionable Triangle. This one Scale may serve the Purpose of any other required Scale, provided you have different Triangles.

E X A M P L E.

If you would have it answer for a Scale of Twenty to an Inch, your Triangle must have its Hypotenuse twice the Length of the Perpendicular. If you require the Scale of Thirty, the Hypotenuse must be three Times the Perpendicular. If a Scale of 40, four Times the Perpendicular. If 50, five Times, and so on ; the Hypotenuse and Perpendicular always bearing the same Proportion to each other as the Denomination of your required Scale to the Number 10. Thus the Triangle required for the Scale of 20, must have its Hypotenuse and Perpendicular in the Proportion of 20 to 10, or 2 to 1 ; for the same Reason the Triangle answerable to a scale of 30, must have its Hypotenuse and Perpendicular in the Proportion of 30 to 10, or 3 to 1 ; for the Scale of 40, as 40 to 10, or 4 to 1, and so on ; consequently any other intervening Scale, namely 25, 35, 45, 55, &c. intended for this Scale of Inches, subdivided into Tenths, require Triangles where Hypotenuses and Perpendiculars are in the Proportion of 25 to 10, or 5 to 2 ; 35 to 10, or 7 to 2 ; 45 to 10, or 9 to 2 ; 55 to 10, or 11 to 2.

To prevent Confusion, the Triangles should

should be stamped above the Flower-de-luce or Index, viz. the Triangle, whose Hypotenuse is twice the Perpendicular, must be stamped, or marked thus ††, for a Scale of 20. If the Hypotenuse be three Times the Perpendicular, |||| for a Scale of 30. If four Times the Perpendicular, §§§§, for a Scale of 40, &c.

Another great Convenience attending these changeable Triangles is, the Advantage of working on a very small Scale, whose Divisions cannot be accurately taken off with the Compasses. Suppose it were required to work from a Scale of an Inch, divided into 100 equal Parts: make the Hypotenuse of your Triangle ten Times the Length of the shortest Perpendicular; then the Index of your Triangle, applied to a common Scale of Inches divided into Tenths, will answer the same Purpose for parallel Distances, as the setting off the required Parts perpendicularly, from this very small Scale of one Inch divided into 100 equal Parts.

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